

REMARKS

In the June 6, 2003 Office Action, the Examiner noted that claims 4, 5, 11-13, 15 and 16 were pending in the application; rejected claims 15 and 16 under the second paragraph of 35 U.S.C. § 112; and rejected claims 4, 5, 11-13, 15 and 16 under 35 U.S.C. § 103. In rejecting the claims, U.S. Patent Application Publications 2001/0050802 to Namiki et al. and 2002/0075560 to Foursa and U.S. Patents 6,433,921 to Wu et al. (References A, C and B, respectively, in the November 22, 2002 Office Action) and 6,052,219 to Kidorf et al. (Reference A in the June 6, 2003 Office Action) were cited. Claims 4, 5, 11-13, 15 and 16 remain in the case. The Examiner's rejections are traversed below.

Rejections under 35 U.S.C. § 112, Second Paragraph

In item 1 on page 2 of the Office Action, claims 15 and 16 were rejected under the second paragraph of 35 U.S.C. § 112 for indefiniteness. The explanation for why the claims are indefinite was that "the power of the pumping lights for each ... Raman amplifier is detected using back-facet monitors at the location of the control unit, rather than at the terminal station ... [and] is transmitted to the terminal station by the control unit." Based on this comment, it is assumed that the word "determining" was being interpreted as equivalent to "detecting". To avoid such interpretation, the word "determining" in claims 15 and 16 has been changed to the intended meaning, "obtaining information regarding" (claims 15 and 16, line 5). This is believed to be consistent with the Examiner's understanding of the invention as expressed in the June 6, 2003 Office Action. However, if claims 15 and 16 are still believed to be indefinite, the Examiner is once again requested to contact the undersigned by telephone prior to issuing any action to arrange an Examiner Interview for the purpose of identifying acceptable language.

Rejections under 35 U.S.C. § 103

In item 1 on pages 3-4 of the Office Action, claims 4, 5 and 13 were rejected under 35 U.S.C. § 103(a) as unpatentable over Namiki et al. in view of Kidorf et al. This rejection was substantially similar to the rejection in the November 22, 2002 Office Action with the addition of Kidorf et al. which discloses an optical transmission system having "optical transmission fiber paths 2 and 4 supporting bi-directional communication" (column 2, lines 42-43).

There are two optical pump units described in detail in Kidorf et al. Illustrated in Fig. 5 is a prior art pump and illustrated in Fig. 7 is the pump disclosed by Kidorf et al. The only difference between the two pumps is the use of a circulator in the latter and a WDM coupler in

the former. It is clear, particularly from the Brief Description of the Drawings, that one of the amplifiers depicted in Figs. 5 and 7 would be used in each of the amplifiers 7 and 8 illustrated in Fig. 3. In other words, the optical transmission fiber paths 2 and 4 are completely separate and related to each other only in having the same end points. On the other hand, the present invention is directed an optical transmission system having a bi-directional transmission line that is not as independent as the optical transmission fiber paths taught by Kidorf et al. As illustrated in Figs. 8-16 of the application, different wavelengths of light are multiplexed in each amplifier stage and the multiplexed light is used "to amplify optical signals on both of the first and second optical transmission lines" (e.g., claim 4, lines 7-8).

Although the language quoted in the preceding sentence is unchanged from the claims presented in the Amendment filed by certificate of mail on February 24, 2003 and received by the Office of Initial Patent Examination on March 3, 2003, the independent claims have been amended to recite "an optical device to multiplex a plurality of pump lights to produce multiplexed light and to guide the multiplexed light to both of the first and second optical transmission lines" (claims 4 and 5, lines 5-7). These additional limitations further emphasize the differences between the present invention and Kidorf et al. Since Namiki et al. and the other cited references fail to even teach bi-directional optical transmission lines, nothing in the cited prior art teaches or suggest amplifying bi-directional optical transmission lines in the manner recited in the claims. The recited structure enables an optical transmission system according to the present invention to avoid degradation of the optical signal/noise ratio by increasing pump amplification before and after a failed pump light source while keeping the transmission in both directions well balanced.

For the above reasons, it is submitted that claims 4, 5 and 13 patentably distinguish over Namiki et al. in view of Kidorf et al.

In item 2 on pages 4-5 of the Office Action, claims 11 and 12 were rejected as unpatentable over Namiki et al. in view of Kidorf et al. and further in view of Foursa. Since claims 11 and 12 depend from claim 4 and as discussed in the previous Amendment, Foursa does not add anything to Namiki et al. (and Kidorf et al.) regarding bi-directional optical transmission lines, it is submitted that claims 11 and 12 patentably distinguish over the prior art for the reasons discussed above with respect to claims 4, 5 and 13.

In item 3 on pages 5-6 of the Office Action, claims 15 and 16 were rejected as unpatentable over Namiki et al. in view of Wu et al. However, since Kidorf et al. was discussed

in the last paragraph on page 6 of the Office Action, it is assumed that claims 15 and 16 were intended to be rejected over the combination of Namiki et al. in view of Kidorf et al. and further in view of Wu et al.

As discussed in the previous Amendment, Wu et al. does not add anything to Namiki et al. (and Kidorf et al.) regarding bi-directional transmission lines. Claims 15 and 16 have been amended to recite "multiplexing the pump lights to produce multiplexed light; and guiding the multiplexed light to both of the first and second optical transmission lines" (claims 15 and 16, last three lines). Therefore, it is submitted that claims 15 and 16 patentably distinguish over the recited prior art for the reasons discussed above with respect to claims 4, 5 and 13.

Entry of Amendment

As noted above, claims 4 and 5 previously recited that "each of the Raman amplifiers ... amplify optical signals on both of the first and second optical transmission lines" (claims 4 and 5, lines 5-8) and therefore the teachings of Kidorf et al. were insufficient to suggest to one of ordinary skill in the art modification of Namiki et al. While the amendments to claims 4 and 5 further emphasize the differences, a new search is not required by the changes, but a more relevant reference, if one exists, was required by the limitations previously recited in the claims. Therefore, entry of this Amendment is respectfully requested.

Summary

It is submitted that the references cited in the Office Action, taken individually or in combination, do not teach or suggest the features of the present claimed invention. Thus, it is submitted that claims 4, 5, 11-13, 15 and 15 are in a condition suitable for allowance. Reconsideration of the claims and an early Notice of Allowance are earnestly solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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